INTER-OFFICE CORRESPONDENCE

Laboratory-Indianapolis PLANT

DATE July 28, 1954

cc: Mr. T. E. Reilly

TO: Mr. H. R. Horner

FROM: J. A. Lauck

SUBJECT: ST. LOUIS PARK PLANT INSPECTION

I) The most serious problem at the St. Louis Park plant is the boiler system and the plant water system which feeds the boiler. The water system must be improved soon or we can expect serious boiler damage. At present water is taken from a 12" well by an air lift, collected in an open pan about 3' x 4' x 6' and run off into an open pond. The pond usually has an oil slick and the water is not clear. A steam reciprocating pump is used to supply a 4" screwed main with water from the pond. This main runs through the plant serving one plant washroom, the refinery, the office washroom, and the boiler house. A sample of this water taken from the office wash basin contained solid material both lighter and heavier than the water. It is this water which is used in the boiler and which must account for the poor condition of the Riley boiler. The boiler was turbined in May and already has accumulated up to 1/16" scale on the tubes and 1/8" on the shell. The boiler is normally shut down every three months for washing out.

The water taken directly from the well was tested by the state and was found to be safe water for drinking. However, without a closed water system it cannot be safe.

The air lift is supplied by a 35 HP air compressor which in addition furnishes air intermittently for loading tar trucks. But for water service the compressor must run almost constantly. In addition to the compressor a steam pump must run constantly on water service.

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The air lift might be blamed for the corrosion of the 4" screwed water line through the plant. This line has approximately 32 wooden plugs driven into it through the years as leaks developed. Without water meters we cannot tell how much water is lost between the pump and the boiler house but it probably is appreciable.

No standby connection to the city water main in installed.

The boiler feedwater pumps are in bad condition and both must be used to supply water to one boiler. I am sure these pumps are beyond economic repair.

The boiler feedwater heater does a good job in spite of its age and improper installation. The heater is too low to provide proper suction head to the feedwater pumps. Raising the heater 4'-6" will provide that head and will not interfere with overhead equipment. At the time the heater is moved an exhaust steam header should be added to allow a sufficient straight run of pipe before the oil separating section of the heater. The oil separator cannot function properly without this straight section and the oil deposits in the heater are enough evidence of poor operation.

I believe the time has come to change to gas fuel in the boiler. A copy of the gas rate in effect is included in my first report on the St. Louis Park plant. A comparison will be made with the present oil costs before proceeding further on this conversion but many of the Minneapolis industries have already changed to gas, and several burner peddlers have already promised us great savings in fuel costs by converting to gas. The gas is

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available only on an interruptible service and therefore oil must be maintained as standby.

The oil burners in the Riley boiler operate at 250 psi. We reduced the pressure to about 200 psi and the fires went out. After a few minor flarebacks we left the oil pressure at 250 psi.

No flame failure protection, low water cutoff, feedwater regulator or combustion control is installed. Two steam flow meters are installed but both have been inoperable for several years.

The boiler refractory has failed in several places so that the steel casing has burned through. The casing was repaired but the refractory repairs, if made at all, were not satisfactory. Many cracks remain and many sections of brick have fallen out. The boiler top is likewise in poor shape and moves considerably during operation as if the refractory were broken or loose.

These conditions are being described by letter to the Riley Stoker Corp. by the plant engineer, Mr. John Peters, who is asking advice in repairing the boiler top. The side walls will be patched at the next shutdown, according to Mr. Peters.

My recommendation for the boiler plant is that we make improvements in the following order:

Necessary 1) Provide an electric deep well pump and a pressure tank for the 12" well. Also total meter

Highly desirable 2) Install a new plant water main from the well to the boiler

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house with additional connections as at present.

3) Install a connection with meter from the city water firemain in the plant to the boiler house for standby service.

4) Provide two new boiler feedwater pumps—one steam turbine and one electric.

5) Raise the feedwater heater and install a proper exhaust steam header.

6) Install feedwater regulator, low water cutoff and flame failure protection in the Riley Boiler.

7) Install a gas main into the plant for use first at the boiler house and later in the refinery.

8) Install new oil burners which operate at 50 psi in the boiler for standby and gas burners for regular service.

9) Install combustion controls on the boiler and repair or replace one flow meter.

10) Investigate the practicability of burning wood shavings in the Riley boiler along with its regular fuel.

The 12" well is over 900 ft. deep and contains a 12" casing of unknown length, 152 ft. of 4 1/2" pipe and 141 ft. of 1 1/2" pipe. Water level is approximately 40 ft. below the ground.

If the electric well pump is provided, the pond will dry up and the fire pump will have to be connected to the city water firemain in the plant. At present it takes suction only from the pond. Evaporation is too great to

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keep the pond for a fire water reservoir.

II) The next problem of importance is the condtion of the condensers and pans in the refinery and the vapor system outside the building.

The condensers and pans are badly deteriorated. The condenser coils are not complete since they were replaced on the job and it was impossible to fit all lengths of pipe into the condenser as originally designed. As a result, the oils are too hot and excessive vapors accumulate. These vapors are drawn into a large tank on the refinery roof by a 20 HP fan and ejected through another large tank on the ground outside the refinery and through a water scrubber. In spite of this Rube Goldberg the fumes cause complaints from the neighbors. A new housing project is located to the southeast, in the direction of the prevailing winds, and on a hill so that they are on a level with our stacks.

If these condensers and pans were replaced, and condenser coils of proper length were used, the amount of vapors might be handled by standard stacks. If the fumes are still objectionable, then I suggest using an old condenser and a small steam jet to draw the fumes in. This system is used at Lone Star for pitch fumes while blowing stills and it completely eliminates the fumes. If non-condensable gases remaining are objectionable, they might be burned in a small unit as described in an article entitled" Control of Non-condensable Vapors", presented by Mr. Schulz of Flintkote Co. to the Asphalt Roofing Industry Bureau meeting of manufacturing executives. This article was sent you by Dr. Mootz on December 22, 1953. The equipment was

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produced by the Allied Asphalt and Mineral Co. in New Jersey. I will investigate this further during my trip to Newark.

III) Pitch Bays in Refinery--

The small preliminary drawing of the proposed pitch bays in the refinery dated 6/17/54 is incorrect in that it shows the bays in the northwest section. The usable stills are in that section, but the southeast end contains four abandoned stills in settings and four partial settings with stills removed. There is sufficient space in the southeast end so that the partition wall between the pan room and still room will not have to be removed.

The railroad track parallels the refinery building for one-half the length of the building at a distance of 10 ft. to the centerline of the track. Then it curves outward and is 16'-6" from the southeast end of the building. A clearance of 8 ft. to the track centerline is required so the loading dock will either have to be within the building or the track will have to be moved away from the building and straightened out. The latter will be simple and the space will be available when the coke pile is eliminated. It will, however, require the construction of a covered loading dock. If the loading dock is to be built within the refinery the track will have to be straightened out to bring it close to the dock.

The pan room in the southeast end contains 11 pans, 8 condensers, and a large amount of piping. This room, if cleared, might be used to house the water pressure tank mentioned in item I of this report, and the controls for

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Suggested to JL that it may be more economical and quit over the purpose to insulate the lines (which we will do anyway) and put in a sump pump at the end of the trench system to keep trenches dry. Also will keep tank with out of water.

the deep well pump.

IV) The steam main through the tank farm consists of a 2" uninsulated pipe running in trenches and is partly submerged in water. An overhead insulated line will reduce the boiler load considerably. The length of such an insulated line will be approximately 400 ft. but only the first 90 ft. of this line need be overhead to clear the roadway. The remainder should be supported on piers near the ground for ease of maintenance.

V) The railroad tracks require a large amount of repair work as outlined in my report on the plant. Mr. Flaa has discovered a good deal on frogs and switches with one of the railroads in Minneapolis. They are abandoning a section of their railroad and are offering frogs and switches, many of them new, at the price of scrap. I advised Mr. Flaa and Mr. Holstrom to purchase immediately all sections needed to put our tradks in good condition and enough for spare. The plant welder has been repairing tracks continuousl but theamount of track makes it impossible for him to keep up with repairs needed and perform other maintenance jobs also.

Very truly yours,

JAL:rr

J. A. Lauck

After hard rains the water on the yard and refinery building stands around makes deep. This is a serious problem. Water apparently runs down from the street to our plant and aggravated recently by paving the street near us.

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